3.11 AIR QUALITY

This section describes existing air quality conditions in the project area, summarizes applicable regulations, and analyzes potential short-term construction and long-term operational air quality impacts of the proposed project and alternatives. In addition, mitigation measures are recommended, as necessary, to reduce significant air quality impacts. Model calculations are included in Appendix K.

3.11.1 AFFECTED ENVIRONMENT

Air quality is defined by the concentration of pollutants related to human health. Concentrations of air pollutants are determined by the rate and location of pollutant emissions released by pollution sources, and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, and sunlight. Therefore, ambient air quality conditions within the local air basin are influenced by such natural factors as topography, meteorology, and climate, in addition to the amount of air pollutant emissions released by existing air pollutant sources.

Climate, Topography, and Meteorology

Climate, topography, and meteorology influence regional and local ambient air quality. Southern California is characterized as a semiarid climate, although it contains three distinct zones of rainfall that coincide with the coast, mountain, and desert. San Elijo Lagoon is located in the City of Encinitas in the central coastal portion of San Diego County, and within the San Diego Air Basin (SDAB). The SDAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountain ranges to the east. The topography in the SDAB region varies greatly, from beaches on the west, to mountains and then desert to the east. The mountains to the east inhibit the dispersion of pollutants (generated in the SDAB) to the east.

The climate of the SDAB is characterized by warm, dry summers and mild winters. One of the main determinants of its climatology is a semipermanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. During fall, the region often experiences dry, warm easterly winds, locally referred to as Santa Ana winds, which raise temperatures and lower humidity, often to less than 20 percent. Rainfall in the City of Oceanside, which is the nearest climate monitoring station near the City of Encinitas, averages approximately 10.54 inches annually (WRCC 2012). The heaviest precipitation occurs in

November through April. The mean annual air temperature is 60.3 degrees Fahrenheit (°F), and the mean maximum and mean minimum temperatures are 67.6°F and 52.9°F, respectively (WRCC 2012).

A dominant characteristic of spring and summer is night and early morning cloudiness, locally known as the marine layer. Low clouds form regularly, frequently extending inland over the coastal foothills and valleys. These clouds usually dissipate during the morning, and afternoons are generally clear.

A common atmospheric condition known as a temperature inversion affects air quality in the SDAB. During an inversion, air temperatures get warmer rather than cooler with increasing height. Inversion layers are important for local air quality, because they inhibit the dispersion of pollutants and result in a temporary degradation of air quality. The pollution potential of an area is largely dependent on a combination of winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low-level inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 mph, the atmospheric pollution potential is greatly reduced.

Criteria Air Pollutants

The California Air Resources Board (ARB) and EPA focus on the following air pollutants as indicators of ambient air quality: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}), fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. Because these are the most prevalent air pollutants known to be harmful to human health and EPA regulates them by developing criteria for allowable emission levels, they are commonly referred to as “criteria air pollutants.”

Health-based air quality standards have been established for these pollutants by ARB at the state level and by EPA at the national level. These standards were established to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. A brief description of each criteria air pollutant, including source types and impacts to health, is provided below along with the most current monitoring station data and attainment designations for the project study areas. Table 3.11-1 presents the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS).

Table 3.11-1
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [a]	National Standards [b]	
		Concentration [c]	Primary [c,d]	Secondary [c,e]
Ozone	1 hour	0.09 ppm (180 µg/m^3)	–	Same as primary standard
	8 hours	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable particulate matter (PM_{10})[f]	24 hours	50 µg/m^3	150 µg/m^3	Same as primary standard
	Annual arithmetic mean	20 µg/m^3	–	
Fine particulate matter ($PM_{2.5}$)[f]	24 hours	–	35 µg/m^3	Same as primary standard
	Annual arithmetic mean	12 µg/m^3	12 µg/m^3	15 µg/m^3
Carbon monoxide	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
	8 hours (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
Nitrogen dioxide [g]	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	None
Sulfur dioxide [h]	Annual arithmetic mean	–	0.030 ppm (for certain areas) [h]	–
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas) [h]	–
	3 hours	—	–	0.5 ppm (1,300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
Lead [i,j]	30-day average	1.5 µg/m^3	–	–
	Calendar quarter	–	1.5 µg/m^3 (for certain areas) [j]	Same as primary standard
	Rolling 3-month average	–	0.15 µg/m^3	
Visibility-reducing particles [k]	8 hours	See footnote k	No national standards	
Sulfates	24 hours	25 µg/m^3		
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)		
Vinyl chloride [i]	24 hours	0.01 ppm (26 µg/m^3)		

Notes: mg/m^3 = milligrams per cubic meter; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ppb = parts per billion; ppm = parts per million; µg/m^3 = micrograms per cubic meter

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standards. Contact EPA for further clarification and current national policies.

[c] Concentration expressed first in the units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and reference pressure of 760 torr; parts per million (ppm) in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m3 to 12.0 µg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

Source: ARB 2013

[h] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that the 1-hour national standard is in units of ppb. California standards are in units of ppm. To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical of 0.075 ppm.

[i] The California Air Resources Board (ARB) has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[j] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standards are approved.

[k] In 1989, ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and the "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Ozone

Ozone is a colorless, odorless gas that primarily exists as a beneficial component of the ozone layer in the upper atmosphere (stratosphere) and as a pollutant in the lower atmosphere (troposphere). Tropospheric ozone is a principal cause of lung and eye irritation in the urban environment. It is the principal component of smog, which is formed in the troposphere through a series of reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. Therefore, ROG and NO_X are precursors of ozone. ROG and NO_X emissions are both considered critical in ozone formation. Control strategies for ozone have focused on reducing ROG and NO_X emissions from vehicles, industrial processes using solvents and coatings, and consumer products. Ozone concentrations are generally greatest in the summer, when atmospheric inversions are greatest and the presence of sunlight and heat is high. The SDAB is classified as a federal nonattainment area for ozone.

Particulate Matter (PM)

PM is a complex mixture of extremely small particles and liquid droplets. PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Natural sources of particulates include windblown dust and ocean spray. Some particles are emitted directly into the atmosphere. Others, referred to as secondary particles, result from gases that are transformed into particles through physical and chemical processes in the atmosphere.

The size of PM is directly linked to the potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects such as aggravation of respiratory and cardiovascular disease, lung disease, and decreased lung function. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. EPA groups PM into two categories, coarse PM (PM_{10}), and fine PM ($PM_{2.5}$), as described below.

Inhalable coarse particles (PM_{10}) consist of PM emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and PM formed in the atmosphere by reaction of gaseous precursors. Sources of coarse particles include crushing or grinding operations and dust from paved or unpaved roads. Control of PM_{10} is primarily achieved through the control of dust at construction and industrial sites, the cleaning of paved roads, and the wetting or paving of frequently used unpaved roads.

PM_{10} includes the subgroup of finer particles ($PM_{2.5}$), such as those found in smoke and haze, with an aerodynamic diameter of 2.5 microns or smaller. These finer particles pose an increased health risk because they can deposit deep in the lungs and contain substances that are particularly harmful to human health. Sources of fine particles include all types of combustion activities such as motor vehicles, power plants, wood burning, and certain industrial processes. $PM_{2.5}$ is the major cause of reduced visibility (haze) in California.

Carbon Monoxide (CO)

CO is a colorless and odorless gas that, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Overall, CO emissions are decreasing because of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO concentrations are typically higher in the winter due to higher rates of combustion inefficiency in colder engines; therefore, California has required the use of oxygenated gasoline in the winter months to reduce CO emissions.

Relatively high concentrations of CO are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called "hotspots," that can be hazardous to human receptors adjacent to the intersections.

Nitrogen Dioxide (NO_2)

NO_2 is a gas that is a product of the combustion of fossil fuels generated from vehicles and stationary sources, such as power plants and boilers. NO_2 can cause lung damage. As noted above, NO_2 is a type of NO_X and is a principal contributor to ozone and smog production.

Sulfur Dioxide (SO_2)

SO_2 is a gas that is a product of the combustion of fossil fuels, with the primary source being power plants and heavy industry that utilize coal or oil as fuel. SO_2 is also a product of diesel engine emissions. The human health effects of SO_2 include lung disease and breathing problems for asthmatics. SO_2 in the atmosphere contributes to the formation of acid rain. In the SDAB, there is relatively little combustion of coal and oil; therefore, SO_2 is less of a concern than in other parts of the country.

Lead

Lead is a highly toxic metal that may cause a range of human health effects. Lead anti-knock additives in gasoline represent a major source of lead emissions to the atmosphere. However, lead emissions have significantly decreased due to the near elimination of leaded gasoline use. Lead-based paint, banned or limited by EPA in the 1980s, is a health hazard when it deteriorates by peeling, chipping, or cracking; or generates lead dust when scraped, sanded, or heated.

Odor

Odor is considered an air quality issue, either at the local level (e.g., odor from wastewater treatment) or at the regional level (e.g., smoke from wildfires). An air pollutant means fume, smoke, PM, vapor, gas, odorous substance, or any combination thereof. Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

SDAB Attainment Status

Specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based on the comparison of measured data with federal and state standards. The SDAB currently meets NAAQS for all criteria air pollutants except ozone, PM_{10}, and $PM_{2.5}$. The SDAB currently falls under a federal maintenance plan for CO, following a 1998 redesignation as a CO attainment area. The SDAB is currently classified as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$.

SDAB Existing Air Quality

Ambient air pollutant concentrations in the SDAB are measured at air quality monitoring stations operated by ARB and SDAPCD. The closest and most representative SDAPCD air quality monitoring station to the project site is the Del Mar monitoring station, located at 215 9th Street in Del Mar, California. However, that monitoring station only collects data on concentrations of ozone. The closest monitoring station with complete data is the Escondido monitoring station, located at 600 East Valley Parkway in Escondido, California. Table 3.11-2 presents the most recent available data over the past 3 years from the Del Mar and Escondido monitoring stations as summaries of the exceedances of standards and the highest pollutant levels recorded for years 2010 through 2012.

Table 3.11-2
Ambient Air Quality Summary – Del Mar and Escondido Monitoring Stations

Pollutant Standards	2010	2011	2012
Carbon Monoxide (CO)			
National maximum 8-hour concentration (ppm)	2.46	2.20	3.61
State maximum 8-hour concentration (ppm)	2.46	2.30	3.70
State maximum 1-hour concentration (ppm)	3.9	3.5	4.4
Number of Days Standard Exceeded			
NAAQS 8-hour (>9.0 ppm)	0	0	0
CAAQS 8-hour (>9.0 ppm)	0	0	0
CAAQS 1-hour (>20.0 ppm)	0	0	0
Nitrogen Dioxide (NO_2)			
State maximum 1-hour concentration (ppm)	0.064	0.062	0.062
Annual Average (ppm)	0.014	*	0.013
Number of Days Standard Exceeded			
CAAQS 1-hour	0	0	0
Ozone			
State max 1-hour concentration (ppm)	0.085	0.091	0.088
National maximum 8-hour concentration (ppm)	0.072	0.075	0.079
Number of Days Standard Exceeded			
CAAQS 1-hour (>0.09 ppm)	0	0	0
CAAQS 8- hour (>0.070 ppm)/NAAQS 8-hour (>0.075 ppm)	2/0	1/0	2/2
Particulate Matter (PM_{10}) [a]			
National maximum 24-hour concentration ($\mu g/m^3$)	42.0	40.0	33.0
State maximum 24-hour concentration ($\mu g/m^3$)	43.0	40.0	33.0
State annual average concentration ($\mu g/m^3$)	21.0	18.8	18.1
Estimated Number of Days Standard Exceeded			
NAAQS 24-hour (>150 $\mu g/m^3$)	0	0	0
CAAQS 24-hour (>50 $\mu g/m^3$)	0	0	0
Particulate Matter ($PM_{2.5}$) [a]			
National maximum 24-hour concentration ($\mu g/m^3$)	48.4	69.8	70.7
State maximum 24-hour concentration ($\mu g/m^3$)	52.2	27.4	70.7
National annual average concentration ($\mu g/m^3$)	12.7	13.2	10.8
State annual average concentration ($\mu g/m^3$)	*	10.4	*
Estimated Number of Days Standard Exceeded			
NAAQS 24-hour (>35 $\mu g/m^3$)	2	3	1

$\mu g/m^3$ = micrograms per cubic meter; ppm == parts per million
Source: ARB 2014

As shown in Table 3.11-2, ambient air concentrations of CO, NO_2, and PM_{10} at the Del Mar and Escondido monitoring stations have not exceeded the NAAQS/CAAQS in the past 3 years. $PM_{2.5}$ concentrations exceeded the federal standards every year for the past 3 years, and concentrations of 8-hour ozone registered at the monitoring station have also exceeded the CAAQS every year in the past 3 years.

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These include children, the elderly, people with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Air quality regulators typically define sensitive receptors as schools, hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality.

Residential areas are also considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time.

3.11.2 THRESHOLDS FOR DETERMINING SIGNIFICANCE

A significant impact related to air quality would occur under CEQA if implementation of the project would:

A. Conflict with or obstruct implementation of the applicable air quality plan;

B. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

C. Expose sensitive receptors to substantial pollutant concentrations; or

D. Create objectionable odors affecting a substantial number of people.

These significance thresholds were derived from Appendix G of the State CEQA Guidelines. As stated in Appendix G, the significance criteria established by the applicable air quality management board or air pollution control district may be relied on to make the impact determinations for specific program elements. SDAPCD has not developed quantitative significance thresholds for CEQA projects. However, San Diego County has established recommended screening level thresholds of significance for regional pollutant emissions. Since SDAPCD does not have quantitative significance thresholds, the San Diego County screening thresholds of significance for regional pollutant emissions were used to analyze the impacts of the project. A project with emissions rates below these thresholds is considered to have a less than significant impact on regional and local air quality throughout the SDAB. The County of San Diego *Guidelines for Determining Significance and Report Format and Content Requirements, Air Quality* (2007), which outline these screening level thresholds, state that a project that results in an emissions increase less than these levels would not:

- cause a violation of a state or national ambient air quality standard anywhere that does not already exceed such standard,
- cause additional violations of a national ambient air quality standard anywhere the standard is already being exceeded,
- cause additional violations of a state ambient air quality standard anywhere the standard is already being exceeded, or
- prevent or interfere with the attainment or maintenance of any state or national ambient air quality standard.

Therefore, if the emissions of the proposed project are found to be below the screening level thresholds, it can be concluded that the project would not lead to a violation of a NAAQS or CAAQS. The screening level thresholds are shown in Table 3.11-3.

Table 3.11-3
Regional Pollutant Emission Screening Level Thresholds of Significance

	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	Lead
Pounds per hour	–	25	100	25	–	–	–
Pounds per day	75	250	550	250	100	55	3.2
Tons per year	13.7	40	100	40	15	10	0.6

ROG = reactive organic gases; NOX = oxides of nitrogen; SO_X = sulfur oxides; CO = carbon monoxide; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less, $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less
– = No threshold proposed
Source: County of San Diego 2007

This analysis does not directly evaluate lead or oxides of sulfur (SO_X) because little to no quantifiable and foreseeable emissions of these substances would be generated by the project. Lead emissions have significantly decreased due to the near elimination of leaded fuel use. On- and off-road diesel fuel used in California must meet low sulfur standards established by ARB; thus, SO_X emissions due to diesel exhaust are assumed to be minimal. The cumulative analysis for air quality is included in Chapter 4 of this EIR/EIS, and analyzes whether the project would result in a considerable net increase of criteria pollutants for which the project region is designated nonattainment.

The General Conformity Rule (40 CFR Sections 51.850–51.860 and 93.150–93.160) requires any federal agency responsible for an action in a federal nonattainment or attainment/ maintenance area to demonstrate conformity to the applicable State Implementation Plan (SIP). To do so, the federal agency must determine that the action is either exempt from General Conformity Rule requirements or subject to a formal conformity determination. Conformance to the SIP is demonstrated by obtaining appropriate permits from SDAPCD, or by demonstrating that emissions would be less than *de minimis* thresholds.

General conformity *de minimis* thresholds are appropriate thresholds to be used for determining NEPA significance. A NEPA air quality significance analysis differs from the General Conformity analysis in that all project criteria pollutant emissions are considered: emissions for pollutants where the area has attained the NAAQS, as well as emissions for pollutants where the region is currently designated as a nonattainment or maintenance area. Therefore, in the SDAB, project attainment emissions of SO_X, PM_{10}, and $PM_{2.5}$, would be considered for impact significance under NEPA for air quality in addition to CO, ROG, and NO_X considered under General Conformity.

The total annual direct and indirect project emissions of attainment pollutants, as well as the emissions of nonattainment/maintenance pollutants (analyzed for General Conformity) from project construction and operation activities would be compared against the *de minimis* levels for the attainment status of these pollutants. The applicable *de minimis* thresholds for the project emissions generated in the SDAB are shown in Table 3.11-4.

The principal source of water-based emissions from construction activities would be from diesel engines used for tugboat engines, dredge propulsion, and driving dredge pumps. Tugboats and dredges are registered through the state or permitted at the air district level based on hours of annual operation, not on a project-specific basis. Tugboats and dredges can be registered under ARB's Portable Equipment Registration Program or would be subject to the ARB Commercial Harbor Craft Regulation.

Table 3.11-4
Applicable General Conformity/NEPA Significance Thresholds

Pollutant	*De minimis* Emission Threshold (tons/year)
CO	100
NO_X	100
ROG	100
SO_X	100
PM_{10}	100
$PM_{2.5}$	100

Source: 40 CFR Part 93

When applying for a permit, SDAPCD conducts an analysis based on the projected activity of the dredge on an annual basis. ARB and SDAPCD include an analysis of this equipment based on annual hours of operation. Because the air quality analysis for a dredge's annual permit accounts for the hours of equipment operation throughout the year, emissions would not be anticipated to occur above currently estimated levels as a result of the proposed project. However, to provide a conservative estimate of criteria pollutant emissions associated with the project alternatives, both land- and water-based emissions are included in the analysis.

Project impact significance under CEQA and NEPA, respectively, was determined by comparing the daily emissions for each project alternative to the San Diego County thresholds mentioned above and the annual emissions to the General Conformity *de minimis* thresholds. Project alternatives with the potential to generate emissions exceeding the thresholds would have a significant impact or adverse effect on air quality. If the project alternative's emissions exceed the significance criteria, mitigation measures are available, depending on the nature of the air quality impact.

3.11.3 Environmental Consequences

Lagoon Restoration and Material Disposal

This analysis focuses on the criteria pollutant emissions resulting from construction and subsequent maintenance activities of the proposed project and alternatives. The analysis includes estimates of emissions associated with construction equipment, worker vehicle trips, dredge, and tugboat operation. Emissions from the operation of diesel-fueled off-road equipment were estimated by multiplying peak daily usage (i.e., hours per day) by equipment-specific emission factors and equipment-specific load factors consistent with ARB's off-road mobile source emission inventory model, OFFROAD. Criteria air pollutant emissions from on-road motor vehicles were estimated using EMFAC2011 mobile source emission factors. Worker and heavy-

duty truck trips were estimated based on data provided in the *Traffic Impact Analysis for San Elijo Lagoon Restoration Project* (LLG 2014). Criteria pollutant emissions associated with dredge equipment and tugboat operations were estimated using emission factors from ARB's Harbor Craft Emissions Inventory Database. Other detailed assumptions are provided in Appendix K.

Fugitive PM dust emissions are primarily associated with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles on- and off-site. Fugitive dust emissions are associated with the use of construction equipment on unpaved surfaces, material dumping, and worker vehicle trips to the site. Since the majority of the construction activities for the project alternatives would occur within San Elijo Lagoon, the soil would be saturated, minimizing fugitive dust emissions. Based on the dredging and material disposal approach and schedule, it is not anticipated that the project would result in stockpiling of soil and related fugitive dust emissions. Therefore, the primary source of fugitive dust emissions for the project alternatives would be related to travel of heavy-duty vehicles on unpaved roads. Dust emissions were estimated using regional silt loading emission factors from EPA's Compilation of Air Pollutant Emission Factors (AP-42), including number of vehicles, vehicle weight, and vehicle miles traveled (VMT) per day.

This analysis evaluates the impacts of lagoon restoration and material disposal together. The finding of significance for the CEQA and NEPA thresholds cannot be determined separately and must be based on emissions for the entire project.

Alternative 2A–Proposed Project

Temporary Impacts

Project consistency is based on whether the proposed project would conflict with or obstruct implementation of the Regional Air Quality Strategy (RAQS) and/or applicable portions of the SIP. Projects that are consistent with the assumptions used in development of the applicable air quality plan would not conflict with or obstruct the attainment of the air quality levels identified in the plan, even if the project-level emissions exceed the regional emissions thresholds.

The RAQS was developed pursuant to California Clean Air Act requirements and identifies feasible emissions control measures to provide expeditious progress in San Diego County toward attaining the state ozone standard. The RAQS control measures focus on emission sources under SDAPCD authority, specifically stationary sources and some areawide sources. The RAQS identifies areawide sources as mostly residential sources, including water heaters, furnaces,

architectural coatings, and consumer products. Assumptions for land use development used in the RAQS are taken from local and regional planning documents, including general plan land use designations and zoning.

Consistency with the RAQS is determined by analyzing a project with the assumptions in the RAQS. Emission forecasts rely on projections of VMT by the Metropolitan Planning Organizations, such as SANDAG, and population, employment, and land use projections made by local jurisdictions. The project would primarily involve dredging and off-road equipment operations. On-road trip generation would also occur during construction of the proposed project. Since the the trip generation associated with construction would be temporary, the proposed project would not increase activities and/or emissions associated with on-road mobile sources that have been included in the RAQS. Accordingly, implementation of the proposed project would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with the SDAPCD RAQS. **This impact would be less than significant (Criterion A).**

Construction of the proposed project would result in the temporary generation of ROG, CO, NO_X, PM_{10}, and $PM_{2.5}$ emissions. During construction, criteria air pollutant and precursor emissions would be temporarily and intermittently generated from a variety of sources. Construction would require a combination of both dry and wet methods. Dry construction would involve land-based equipment, such as backhoes, dump trucks, and front-end loaders, to construct various project elements in dry conditions. Wet construction would involve working over water so that material could be removed using hydraulic dredge equipment. Construction equipment and vehicle engines would be maintained in good condition and properly tuned per manufacturers' specifications, and idling time would be limited, as appropriate, to minimize emissions (PDF-10).

The type of dredge equipment selected for the proposed project includes either a diesel-powered or electric dredge, so both equipment types were considered for this analysis. Facilities for electrical power would be provided for use by an electrical dredge. In addition, booster pumps may be necessary to convey material to the disposal locations. Dredging and pump operations could occur 24 hours per day and 7 days per week. To account for maintenance, fueling, and other related activities, dredging and pump equipment is typically assumed to have intermittent periods of nonoperation. For the purposes of this project, dredge equipment is assumed to operate for approximately 20 hours per day. Off-road equipment was assumed to operate up to 10 hours per day and 6 days per week.

Heavy construction equipment would be brought to and taken from the site by way of the regional highway and local street network. Site preparation would also occur during the

mobilization period. Generally, construction would occur in four sequential phases (Section 2.10), on a year-round basis.

As shown in Table 3.11-5, construction emissions for Alternative 2A would result in maximum daily emissions of approximately 100 pounds of ROG, 1,020 pounds of NO_X, 407 pounds of CO, 77 pounds of PM_{10}, and 35 pounds of $PM_{2.5}$. Additional modeling assumptions and details are provided in Appendix K.

Table 3.11-5
Alternative 2A - Estimated Daily Construction Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Phase 1					
Mobilization/Demobilization/Site Preparation	8	70	393	3	3
Construction Equipment/On-Road Vehicles	39	457	155	56	16
Dredging	48	448	199	16	15
Material Disposal	13	116	52	4	4
Phase 1 – Maximum Daily Emissions	**100**	**1,020**	**407**	**77**	**35**
Phase 2					
Construction Equipment/On-Road Vehicles	42	453	154	60	16
Dredging	48	448	199	16	15
Phase 2 – Maximum Daily Emissions	**90**	**900**	**353**	**76**	**31**
Phase 3					
Construction Equipment/On-Road Vehicles	36	386	134	57	14
Dredging	48	448	199	16	15
Phase 3 – Maximum Daily Emissions	**85**	**833**	**333**	**73**	**29**
Phase 4					
Mobilization/Demobilization	2	26	14	1	1
Construction Equipment/On-Road Vehicles	26	253	98	40	10
Dredging	48	448	199	16	15
Phase 4 – Maximum Daily Emissions	**77**	**727**	**311**	**58**	**25**
Maximum Daily Emissions	**100**	**1,020**	**407**	**77**	**35**
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	Yes	Yes	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-5, construction-related emissions of CO, PM_{10}, and $PM_{2.5}$ would not exceed the County's screening level thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. However, construction-generated ROG and NO_X emissions would exceed applicable mass emission thresholds. Therefore, **temporary construction emissions would have a significant impact to regional air quality (Criterion B).**

The General Conformity Rule requires federal agencies to analyze proposed actions according to standardized procedures and to provide a public review and comment period. The conformity determination process is intended to demonstrate that the proposed federal action would not:

- cause or contribute to new violations of federal air quality standards,
- increase the frequency or severity of existing violations of federal air quality standards, and
- delay the timely attainment of federal air quality standards.

The process to evaluate General Conformity for a proposed federal action involves an applicability analysis, conformity determination, and review. According to EPA guidance, the federal agency must apply the applicability requirements found at 40 CFR Section 93.153(b) to the federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of General Conformity is required. The guidance states that the applicability analysis can be (but is not required to be) completed concurrently with analysis required under NEPA. If the regulating federal agency determines that the General Conformity regulations do not apply to the federal action, no further analysis or documentation is required.

Analysis required by the General Conformity Rule focuses on the net increase in emissions compared to ongoing historical conditions. Existing SIPs are presumed to have accounted for routine, ongoing federal agency activities. Conformity analyses are further limited to those direct and indirect emissions over which the federal agency has responsibility and control. General Conformity analyses are not required to analyze emissions sources that are beyond the responsibility and control of the federal agency. Conformity determinations are not required to address emissions that are not reasonably foreseeable or reasonably quantifiable.

The federal agency can also take measures to reduce emissions below *de minimis* levels; therefore, the General Conformity Rule would not apply to the proposed action. The changes must be state or federally enforceable to guarantee that emissions would be below *de minimis* levels. The proposed project assumes various air quality mitigation measures to meet CEQA requirements. Based on CEQA provisions that mitigation measures be required in, or incorporated into, the project (14 CCR Section 15091[a][1]), Mitigation Measures AQ-1 through AQ-5 are considered design features of the proposed project for the purpose of the applicability analysis. This is not considered "mitigation" under the General Conformity Rule, because the rule does not apply to projects that are below *de minimis* levels. Table 3.11-6 summarizes the projected annual emissions associated with construction of Alternative 2A.

Table 3.11-6
Alternative 2A – Construction General Conformity Applicability Analysis

Emission Source	Criteria Pollutant Emissions (tons/year)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
2016					
Mobilization/Demobilization/Site Preparation	0.15	1.46	0.79	0.07	0.06
Construction Equipment/On-Road Vehicles	1.46	10.61	6.11	3.09	0.62
Dredging	3.77	35.02	15.57	1.26	1.16
Material Disposal	0.22	1.09	0.90	0.07	0.07
Total Annual Emissions	**5.60**	**48.18**	**23.36**	**4.49**	**1.90**
2017					
Construction Equipment/On-Road Vehicles	2.68	19.47	11.13	5.85	1.15
Dredging	7.07	65.67	29.19	2.36	2.17
Material Disposal	0.32	1.62	1.34	0.11	0.10
Total Annual Emissions	**10.08**	**86.76**	**41.66**	**8.32**	**3.42**
2018					
Construction Equipment/On-Road Vehicles	2.27	16.67	9.22	6.14	1.04
Dredging	7.25	67.35	29.94	2.42	2.22
Total Annual Emissions	**9.52**	**84.02**	**39.17**	**8.56**	**3.27**
2019					
Mobilization/Demobilization	0.09	0.94	0.49	0.04	0.03
Construction Equipment/On-Road Vehicles	0.80	8.48	3.63	2.19	0.37
Dredging	3.62	46.89	14.93	1.20	1.11
Total Annual Emissions	**4.51**	**56.30**	**19.05**	**3.44**	**1.51**
Maximum Annual Emissions[1]	**10**	**87**	**42**	**8**	**3**
De minimis Thresholds[2]	100	100	100	100	100
Exceed *de minimis* Thresholds?	No	No	No	No	No

[1] Estimates include NO_X emission reductions associated with mitigation measures AQ-1 and AQ-2.
[2] *De minimis* thresholds for General Conformity of SDAB nonattainment pollutants ROG and NO_X, and maintenance pollutant CO; and for NEPA significance determinations of SDAB nonattainment pollutants, and SDAB attainment pollutants PM_{10}, and $PM_{2.5}$.
Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-6, the estimated emissions associated with Alternative 2A are less than the General Conformity *de minimis* thresholds. Therefore, temporary emissions associated with Alternative 2A would conform to the SIP, and a formal conformity analysis would not be required. **No substantial adverse direct or indirect effects would occur.**

Construction of the proposed project would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. PM exhaust emissions from diesel-fueled engines (diesel PM) were identified as a toxic air contaminant (TAC) by ARB in 1998 (ARB 1998). Generation of diesel PM from construction projects typically occurs in a single area for a short period. The variable nature of construction activity also affects the amount of time that equipment is typically within a distance that would expose sensitive receptors to substantial concentrations.

Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB 2005).

Sensitive receptors are located at varying distances from the project site. To the north, surrounding land uses include primarily residential development. Land uses bordering the lagoon to the south primarily consist of single-family residential development. An unincorporated area of San Diego County lies to the east of San Elijo Lagoon and consists of spaced rural development, primarily large estate homes. Residences are located as close as 300 feet from the proposed dredging area in the central basin, and as close as 2,000 feet from the proposed dredging area in the east basin.

Project construction would result in the generation of diesel PM emissions from the use of off-road diesel construction equipment required for vegetation clearing, dredging, and material disposal. Other construction-related sources of diesel PM are material delivery trucks and may include construction worker vehicles. However, not all construction worker vehicles would be diesel-fueled, and most diesel PM emissions associated with material delivery trucks and construction worker vehicles would occur off-site.

The dose of TACs is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period to a fixed amount of emissions results in a higher exposure level and higher health risks for the maximally exposed individual. According to the Office of Environmental Health Hazard Assessment's health risk assessments program (OEHHA 2003), which is used to determine the exposure of sensitive receptors to TAC emissions, risk should be based on a 70-year exposure period; however, such assessments can be limited to the period/duration of activities associated with the project.

The period of construction for the proposed project is approximately 3 years. Thus, if the maximum duration of potentially harmful construction activities near a sensitive receptor is 3 years, then the exposure would be approximately 4 percent of the total exposure period used for typical health risk calculations (i.e., 70 years). However, the distance at which off-road equipment would operate, and dredging and other activities would occur, near sensitive receptors would vary considerably during that time. Construction equipment would operate at a distance reasonably considered to have an effect on sensitive receptors (i.e., within 500 feet) for less time than the total period of the construction schedule.

Because the use of off-road heavy-duty diesel equipment would be temporary during the 3-year construction period and equipment would operate at varying distances from receptors, sensitive

receptors would not be exposed to substantial construction-related emissions of TACs. Therefore, **construction-related TAC impacts to sensitive receptors associated with the proposed project would be less than significant (Criterion C).**

CO concentration is a direct function of motor vehicle activity, particularly during peak commute hours, and certain meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land uses, such as residential areas, schools, preschools, playgrounds, and hospitals. As a result, air districts typically recommend analysis of CO emissions at a local rather than a regional level. Many air districts have established preliminary screening criteria to determine if mobile-source emissions of CO would result in, or substantially contribute to, emissions concentrations that exceed the 1-hour ambient air quality standard of 20 parts per million (ppm) or the 8-hour standard of 9.0 ppm, respectively.

SDAPCD has not established screening criteria for CO hotspots, but the County of San Diego indicates that projects that cause road intersections to operate at or below LOS E with intersection peak-hour traffic volumes exceeding 3,000 vehicles could create a CO hotspot and result in a cumulatively considerable net increase of CO (County of San Diego 2007). According to the traffic study prepared for the proposed project, even with the addition of project traffic during the construction period, signalized and unsignalized intersections in the project area would continue to operate at LOS D or better (LLG 2014). Therefore, it is not anticipated that implementation of the project would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

The human response to odors is extremely subjective, and sensitivity to odors varies greatly among the public. The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. While offensive odors rarely cause physical harm, they can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Potential sources that may emit odors during construction activities include exhaust from diesel construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, nearby receptors would not be affected by diesel exhaust odors associated with project construction. Odors from these sources would be localized and generally confined to the immediate area surrounding the proposed project site. The proposed project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Vegetation clearing and dredging could also

result in odors associated with a high level of organic debris. However, while an odor may be noted, it would be typical of odor currently associated with low tide conditions in the area.

Therefore, the proposed project would not create objectionable odors affecting a substantial number of people. **Impacts associated with odors would be less than significant (Criterion D).**

Permanent

As discussed earlier, project consistency is based on whether the proposed project would conflict with or obstruct implementation of the RAQS and/or applicable portions of the SIP. Monitoring and maintenance activities would occur annually, or as needed, and would require minor on-road trips associated with workers or mobilization of equipment. The proposed project would not require substantial daily on-road vehicle trips for continued project operations because it is a restoration project that would not involve facilities requiring intensive maintenance. Therefore, the proposed project would not substantially increase activities and/or emissions associated with on-road mobile sources that have been included in the RAQS. Accordingly, implementation of the proposed project would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with SDAPCD's RAQS. **The impact would be less than significant (Criterion A).**

Maintenance requirements would be determined during the long-term monitoring program and may include, but are not limited to, inlet maintenance, maintenance dredging, plant removal and/or replacement, weed abatement, trash removal, and bank protection repair. The most intensive maintenance activities would involve maintenance dredging and would occur approximately every 3 to 4 years with the removal of 300,000 cy of material per maintenance cycle. The estimates of operational emissions are based on similar assumptions to those for construction emissions, as the primary sources of emissions would be similar to those used in the construction phase, including dredges, off-road equipment, and on-road motor vehicle trips related to workers. Emission factors were based on the earliest future year (e.g., 2020) that maintenance dredging activities would occur. Table 3.11-7 shows the projected emissions associated with operational and maintenance activities.

Table 3.11-7
Alternative 2A – Estimated Daily Operational and Maintenance Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Construction Equipment/On-Road Vehicles	9.29	76.84	43.49	2.65	2.37
Dredging	38.32	301.20	213.93	10.43	9.60
Total Daily Operational Emissions	**47.61**	**378.04**	**257.42**	**13.09**	**11.97**
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	No	**Yes**	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-7, operational emissions of ROG, CO, PM_{10}, and $PM_{2.5}$ would not exceed the County's screening level thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. However, NO_X emissions associated with maintenance activities would exceed the applicable mass emission threshold. Therefore, **operational emissions associated with Alternative 2A would have a significant impact to regional air quality (Criterion B).**

The General Conformity Rule requires federal agencies to analyze proposed actions according to standardized procedures. Analysis required by the General Conformity Rule focuses on the net increase in emissions compared to ongoing historical conditions. Table 3.11-8 summarizes the projected annual emissions associated with operational and maintenance activities for Alternative 2A.

Table 3.11-8
Alternative 2A – Operational and Maintenance General Conformity Analysis

Emission Source	Criteria Pollutant Emissions (tons/year)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
2020					
Construction Equipment/On-Road Vehicles	0.64	5.38	3.02	0.18	0.16
Dredge	2.87	22.59	16.04	0.78	0.72
Total Annual Emissions	**3.51**	**27.97**	**19.07**	**0.97**	**0.88**
De minimis Thresholds[1]	100	100	100	100	100
Exceed *de minimis* Thresholds?	No	No	No	No	No

[1] *De minimis* thresholds for General Conformity of SDAB nonattainment pollutants ROG and NO_X, and maintenance pollutant CO; and for NEPA significance determinations of SDAB nonattainment pollutants, and SDAB attainment pollutants SO_X, PM_{10}, and $PM_{2.5}$.

Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-6, the estimated operation and maintenance emissions associated with Alternative 2A are less than the General Conformity *de minimis* thresholds. Therefore, operational emissions associated with Alternative 2A would conform to the SIP, and a formal

conformity analysis would not be required. **No substantial adverse direct or indirect effects would occur.**

Similar to construction activities, maintenance activities for the proposed project would result in diesel exhaust emissions from on-site heavy-duty equipment. Maintenance activities for Alternative 2A would occur every 3 years for a period of 6 months. Because off-road heavy-duty diesel equipment would be used for a relatively short time period every 3 years, because equipment would operate at varying distances, and because further reductions in exhaust emissions would be made, maintenance-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. Therefore, **operation and maintenance-related TAC impacts to sensitive receptors associated with the proposed project would be less than significant (Criterion C).**

As mentioned earlier, signalized and unsignalized intersections in the project area would continue to operate at LOS D or better with implementation of the project alternatives. Therefore, it is not anticipated that operation of the proposed project would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for either the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

Operational emissions associated with maintenance activities, such as dredging, would include odors from exhaust from diesel equipment similar to construction activities. Infrequent maintenance worker trips would not be anticipated to generate or expose persons to substantial odor emissions. Therefore, the proposed project would not create objectionable odors affecting a substantial number of people. **Impacts associated with odors would be less than significant (Criterion D).**

Alternative 1B

Temporary

Similar to the proposed project, construction of Alternative 1B would primarily involve dredging and off-road equipment operations. On-road trip generation would also occur during construction of Alternative 1B. Since this would only occur for the duration of the construction period, Alternative 1B would not substantially increase activities and/or emissions associated with on-road mobile sources that have been included in the RAQS. Accordingly, implementation of Alternative 1B would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with the SDAPCD RAQS. **This impact would be less than significant (Criterion A).**

Construction of Alternative 1B would be essentially the same as that for Alternative 2A, with the exception of the components of the tidal inlet, a new Coast Highway 101 bridge, and roadway approaches. As shown in Table 3.11-9, construction emissions for Alternative 1B would result in maximum daily emissions of approximately 87 pounds of ROG, 861 pounds of NO_X, 355 pounds of CO, 71 pounds of PM_{10}, and 29 pounds of $PM_{2.5}$ for infrastructure and the initial export of 1.4 mcy of material. This conservative estimate of maximum daily emissions would not exceed South Coast Air Quality Management District (SCAQMD) construction thresholds of significance. Additional modeling assumptions and details are provided in Appendix K.

As shown in Table 3.11-9, construction-related emissions of CO, PM_{10}, and $PM_{2.5}$ would not exceed the County's screening level thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. However, construction-generated ROG and NO_X emissions would exceed applicable mass emission thresholds. Therefore, **temporary construction emissions would have a significant impact to regional air quality (Criterion B).**

Table 3.11-9
Alternative 1B - Estimated Daily Construction Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Phase 1					
Mobilization/Demobilization/Site Preparation	8	70	39	3	3
Construction Equipment/On-Road Vehicles	26	297	103	50	11
Dredging	48	448	199	16	15
Material Disposal	13	116	52	4	4
Phase 1 – Maximum Daily Emissions	**87**	**861**	**355**	**71**	**29**
Phase 2					
Construction Equipment/On-Road Vehicles	30	305	108	54	11
Dredging	48	448	199	16	15
Phase 2 – Maximum Daily Emissions	**78**	**753**	**307**	**70**	**26**
Phase 3					
Construction Equipment/On-Road Vehicles	30	305	108	54	11
Dredging	48	448	199	16	15
Phase 3 – Maximum Daily Emissions	**78**	**753**	**307**	**70**	**26**
Phase 4					
Mobilization/Demobilization	2	26	14	1	1
Construction Equipment/On-Road Vehicles	26	251	95	40	10
Dredging	48	448	199	16	15
Phase 4 – Maximum Daily Emissions	**76**	**725**	**308**	**58**	**25**
Maximum Daily Emissions	**87**	**861**	**355**	**71**	**29**
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	Yes	Yes	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

Table 3.11-10 summarizes the projected annual emissions associated with construction of Alternative 1B.

Table 3.11-10
Alternative 1B – Construction General Conformity Applicability Analysis

Emission Source	Criteria Pollutant Emissions (tons/year)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
2016					
Mobilization/Demobilization/Site Preparation	0.15	1.46	0.79	0.07	0.06
Construction Equipment/On-Road Vehicles	1.36	9.84	5.73	3.05	0.58
Dredging	3.77	35.02	15.57	1.26	1.16
Material Disposal	0.22	1.09	0.90	0.07	0.07
Total Annual Emissions	**5.51**	**47.41**	**22.98**	**4.44**	**1.86**
2017					
Construction Equipment/On-Road Vehicles	2.48	17.78	10.31	5.76	1.07
Dredging	7.07	65.67	29.19	2.36	2.17
Material Disposal	0.32	1.62	1.34	0.11	0.10
Total Annual Emissions	**9.88**	**85.07**	**40.84**	**8.22**	**3.34**
2018					
Construction Equipment/On-Road Vehicles	2.20	14.88	8.65	6.06	0.99
Dredging	7.25	67.35	29.94	2.42	2.22
Total Annual Emissions	**9.45**	**82.23**	**38.60**	**8.48**	**3.22**
2019					
Mobilization/Demobilization/Site Preparation	0.09	0.94	0.49	0.04	0.03
Construction Equipment/On-Road Vehicles	1.04	9.55	4.10	2.26	0.43
Dredging	3.62	46.89	14.93	1.20	1.11
Total Annual Emissions	**4.74**	**57.38**	**19.52**	**3.50**	**1.58**
Maximum Annual Emissions[1]	**10**	**85**	**41**	**8**	**3**
De minimis Thresholds[2]	100	100	100	100	100
Exceed *de minimis* Thresholds?	No	No	No	No	No

[1] Estimates include NO_X emission reductions associated with mitigation measures AQ-1 and AQ-2.
[2] *De minimis* thresholds for General Conformity of SDAB nonattainment pollutants ROG and NO_X, and maintenance pollutant CO; and for NEPA significance determinations of SDAB nonattainment pollutants, and SDAB attainment pollutants PM_{10}, and $PM_{2.5}$.
Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-10, the estimated annual emissions associated with Alternative 1B are less than the General Conformity *de minimis* thresholds. Therefore, temporary emissions associated with Alternative 1B would conform to the SIP, and a formal conformity analysis would not be required. **No substantial adverse effects would occur.**

Similar to Alternative 2A, construction activities for Alternative 1B would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Because the use of off-road heavy-duty diesel equipment would be temporary, because equipment would operate at varying

distances, and because further reductions in exhaust emissions would be made, sensitive receptors would not be exposed to substantial construction-related emissions of TACs. Therefore, **construction-related TAC impacts to sensitive receptors associated with Alternative 1B would be less than significant (Criterion C).**

Similar to Alternative 2A, even with the addition of project traffic during the construction period, signalized and unsignalized intersections in the project area would continue to operate at LOS D or better (LLG 2014). Since Alternative 1B would not cause road intersections or roadway segments to operate at or below LOS E, it is not anticipated that implementation of the project would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

Construction of Alternative 1B would not include a new tidal inlet or a new Coast Highway 101 bridge with roadway approaches. As mentioned earlier, signalized and unsignalized intersections in the project area would continue to operate at LOS D or better with implementation of the project alternatives. It is not anticipated that implementation of the project would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for either the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

Similar to Alternative 2A, potential sources that may emit odors during construction activities for Alternative 1B include exhaust from diesel construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, nearby receptors would not be affected by diesel exhaust odors associated with project construction. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. Alternative 1B would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Vegetation clearing and dredging could also result in odors associated with a high level of organic debris. However, while an odor may be noted, it would be typical of odor currently associated with low tide conditions in the area. Therefore, **Alternative 1B would not create objectionable odors affecting a substantial number of people and impacts would be less than significant (Criterion D).**

Permanent

As discussed earlier, project consistency is based on whether Alternative 1B would conflict with or obstruct implementation of the RAQS and/or applicable portions of the SIP. Monitoring and maintenance activities would occur annually, or as needed, and would require minor on-road

trips associated with workers or mobilization of equipment due to limited locations and activities anticipated for maintenance, as described in Section 2.10. Alternative 1B would not require significant daily on-road vehicle trips for continued project operations. Therefore, Alternative 1B would not significantly increase activities and/or emissions associated with on-road mobile sources that have been included in the RAQS. Accordingly, implementation of Alternative 1B would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with SDAPCD's RAQS. **The impact would be less than significant (Criterion A).**

Maintenance requirements would be determined during the long-term monitoring program and may include, but are not limited to, remedial dredging, plant replacement, weed abatement, trash removal, and bank protection repair. The most intensive maintenance activities would involve inlet maintenance and would occur annually for approximately 4 weeks with the removal of 40,000 cy of material per year by mechanical equipment (not a dredge). The estimates of operational emissions are based on similar assumptions to those for construction emissions, as the primary sources of emissions would be similar to those used in the construction phase, including off-road equipment and on-road motor vehicle trips related to workers. Table 3.11-11 shows the projected emissions associated with operational and maintenance activities.

Table 3.11-11
Alternative 1B – Estimated Daily Operational and Maintenance Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Construction Equipment/On-Road Vehicles	4.66	30.25	19.34	1.17	1.04
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	No	No	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-11, operational emissions of ROG, NO_X, CO, PM_{10}, and $PM_{2.5}$ would not exceed the County's screening level thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. Therefore, **operational emissions would have a less than significant direct impact to regional air quality (Criterion B).**

Table 3.11-12 summarizes the projected annual emissions associated with construction of Alternative 1B.

Table 3.11-12
Alternative 1B – Operational and Maintenance General Conformity Applicability Analysis

Emission Source	Criteria Pollutant Emissions (tons/year)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Annual Construction Equipment/On-Road Vehicle Emissions	0.07	0.45	0.29	0.02	0.02
De minimis Thresholds[1]	100	100	100	100	100
Exceed *de minimis* Thresholds?	No	No	No	No	No

[1] *De minimis* thresholds for General Conformity of SDAB nonattainment pollutants ROG and NO_X, and maintenance pollutant CO; and for NEPA significance determinations of SDAB nonattainment pollutants, and SDAB attainment pollutants SO_X, PM_{10}, and $PM_{2.5}$.

Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-12, the estimated annual emissions associated with Alternative 1B are less than the General Conformity *de minimis* thresholds. Therefore, temporary emissions associated with Alternative 1B would conform to the SIP, and a formal conformity analysis would not be required. **No substantial adverse direct or indirect effects would occur.**

Similar to construction activities, operation and maintenance activities for Alternative 1B would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Because the use of off-road heavy-duty diesel equipment would be temporary, because equipment would operate at varying distances, and because further reductions in exhaust emissions would be made, maintenance-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. Therefore, **operation and maintenance-related TAC impacts to sensitive receptors associated with Alternative 1B would be less than significant (Criterion C).**

Operation and maintenance of Alternative 1B would not cause road intersections to operate at or below LOS E. Therefore, it is not anticipated that operation of Alternative 1B would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for either the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

Operational emissions associated with maintenance activities would include odors from exhaust from diesel equipment similar to construction activities. Infrequent maintenance worker trips would not be anticipated to generate or expose persons to substantial odor emissions. Therefore, **Alternative 1B would not create objectionable odors affecting a substantial number of people and impacts would be less than significant (Criterion D).**

Alternative 1A

Temporary

Similar to the proposed project, construction of Alternative 1A would primarily involve dredging and off-road equipment operations. On-road trip generation would also occur during construction of Alternative 1A. Alternative 1A would result in a maximum trip generation of 120 light-duty vehicle and 89 heavy-duty truck trips per day during the construction period. Since this would only occur for the duration of the construction period, Alternative 1A would not significantly increase activities and/or emissions associated with on-road mobile sources that have been included in the RAQS. Accordingly, implementation of Alternative 1A would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with the SDAPCD RAQS. **This impact would be less than significant (Criterion A).**

Construction of Alternative 1A would be different from the other alternatives, but less complicated since it does not involve widespread dredging within the lagoon or require temporary dike construction or phasing. Similar to Alternative 1B, Alternative 1A does not include the components of the tidal inlet, a new Coast Highway 101 bridge, or roadway approaches. As shown in Table 3.11-13, construction emissions for Alternative 1A would result in maximum daily emissions of approximately 112 pounds of ROG, 1,076 pounds of NO_X, 462 pounds of CO, 80 pounds of PM_{10}, and 37 pounds of $PM_{2.5}$ for the initial export of 160,000 cy of material by dredging equipment. Besides the difference in the volume and frequency of export for construction materials between Alternate 1A and 1B, the distance to the material disposal location at LA-5 would result in added emissions for Alternate 1A. Additional modeling assumptions and details are provided in Appendix K.

As shown in Table 3.11-13, construction-related emissions of CO, PM_{10}, and $PM_{2.5}$ would not exceed the County's screening level thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. However, construction-generated ROG and NO_X emissions would exceed applicable mass emission thresholds. Therefore, **temporary construction emissions would have a significant impact to regional air quality (Criterion B).**

Table 3.11-13
Alternative 1A – Estimated Daily Construction Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Phase 1	92	470	760	30	28
Mobilization/Demobilization/Site Preparation	8	70	39	3	3
Construction Equipment/On-Road Vehicles	23	280	97	51	10
Dredging	19	166	79	6	5
Material Disposal	69	630	286	23	21
Phase 1 – Maximum Daily Emissions	**112**	**1,076**	**462**	**80**	**37**
Phase 2	23	280	97	51	10
Mobilization/Demobilization	2	26	14	1	1
Construction Equipment/On-Road Vehicles	18	191	70	29	7
Dredging	19	166	79	6	5
Phase 2 – Maximum Daily Emissions	39	383	163	36	13
Maximum Daily Emissions	**112**	**1,076**	**462**	**80**	**37**
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	Yes	Yes	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

Table 3.11-14 summarizes the projected annual emissions associated with construction of Alternative 1A.As shown in Table 3.11-14, the estimated emissions associated with Alternative 1A are less than the General Conformity *de minimis* thresholds. Therefore, temporary emissions associated with Alternative 1A would conform to the SIP, and a formal conformity analysis would not be required. **No substantial adverse direct or indirect effects would occur.**

Similar to Alternative 2A, construction activities for Alternative 1A would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. However, construction would occur for an even shorter period of time and exposure of sensitive receptors to TAC emissions would be less than 1 percent of the total exposure period used for typical health risk calculations (i.e., 70 years). Because the use of off-road heavy-duty diesel equipment would be temporary, because equipment would operate at varying distances, and because further reductions in exhaust emissions would be made, construction-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. Therefore, **construction-related TAC impacts to sensitive receptors associated with Alternative 1A would be less than significant (Criterion C).**

Table 3.11-14
Alternative 1A – Construction General Conformity Applicability Analysis

Emission Source	Criteria Pollutant Emissions (tons/year)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
2016/2017					
Mobilization/Demobilization/Site Preparation	0.15	1.46	0.79	0.07	0.06
Construction Equipment/On-Road Vehicles	1.36	10.33	5.58	2.77	0.58
Dredging	1.29	11.22	5.34	0.39	0.36
Material Disposal	0.55	2.77	2.28	0.19	0.17
Total Annual Emissions	**3.35**	**25.79**	**13.99**	**3.41**	**1.16**
2018					
Mobilization/Demobilization	0.09	0.94	0.49	0.04	0.03
Construction Equipment/On-Road Vehicles	0.53	3.89	2.24	1.03	0.22
Dredging	0.64	5.61	2.67	0.19	0.18
Material Disposal	0.28	1.39	1.14	0.09	0.09
Total Annual Emissions	**1.54**	**11.82**	**6.54**	**1.36**	**0.52**
Maximum Annual Emissions[1]	**3.3**	**26**	**14**	**3**	**1**
De minimis Thresholds[2]	100	100	100	100	100
Exceed *de minimis* Thresholds?	No	No	No	No	No

[1] Estimates include NO_X emission reductions associated with mitigation measures AQ-1 and AQ-2.
[2] *De minimis* thresholds for General Conformity of SDAB nonattainment pollutants ROG and NO_X, and maintenance pollutant CO; and for NEPA significance determinations of SDAB nonattainment pollutants, and SDAB attainment pollutants PM_{10}, and $PM_{2.5}$.
Source: Modeled by AECOM 2014; for more detail see Appendix K

Similar to Alternative 2A and Alternative 1B, even with the addition of project traffic during the construction period, signalized and unsignalized intersections in the project area would continue to operate at LOS D or better (LLG 2014). Since Alternative 1A would not cause road intersections to operate at or below LOS E, it is not anticipated that implementation of the project would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

Similar to Alternative 2A, potential sources that may emit odors during construction activities for Alternative 1A include exhaust from diesel construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, nearby receptors would not be affected by diesel exhaust odors associated with project construction. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. Alternative 1A would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Vegetation clearing and dredging could also result in odors associated with a high level of organic debris. However, while an odor may be noted, it would be similar to existing low tide conditions and would not be atypical for the area. Therefore, Alternative 1A would not create objectionable

odors affecting a substantial number of people. **Impacts associated with odors would be less than significant (Criterion D).**

Permanent

As discussed earlier, project consistency is based on whether the project would conflict with or obstruct implementation of the RAQS and/or applicable portions of the SIP. Monitoring and maintenance activities would occur annually, or as needed, and would require minor on-road trips associated with workers or mobilization of equipment. Alternative 1A would not require significant daily on-road vehicle trips for continued project operations. Therefore, Alternative 1A would not significantly increase activities and/or emissions associated with on-road mobile sources that have been included in the RAQS. Accordingly, implementation of Alternative 1A would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with the SDAPCD RAQS. **The direct and indirect impacts would be less than significant (Criterion A).**

Maintenance requirements would be determined during the long-term monitoring program and may include, but are not limited to, remedial dredging, plant replacement, weed abatement, trash removal, and bank protection repair. The most intensive maintenance activities would occur annually for approximately 3 weeks and would involve inlet maintenance with the removal of 35,000 cy of material per year by land-based mechanical equipment (not a dredge). The estimates of operational emissions are based on similar assumptions to those for construction emissions, as the primary sources of emissions would be similar to those used in the construction phase, including off-road equipment and on-road motor vehicle trips related to workers. Table 3.11-15 shows the projected emissions associated with operational and maintenance activities.

Table 3.11-15
Alternative 1A – Estimated Daily Operational and Maintenance Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Construction Equipment/On-Road Vehicles	4.66	30.25	19.34	1.17	1.04
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	No	No	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-15, operational emissions of ROG, NO_X, CO, PM_{10}, and $PM_{2.5}$ would not exceed the County's screening level thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. **Therefore, operational emissions would have a less than significant impact to regional air quality (Criterion B).**

Table 3.11-16 summarizes the projected annual emissions associated with construction of Alternative 1A.

Table 3.11-16
Alternative 1A – Operations and Maintenance General Conformity Applicability Analysis

Emission Source	Criteria Pollutant Emissions (tons/year)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Annual Construction Equipment/On-Road Vehicle Emissions	0.06	0.39	0.25	0.02	0.01
De minimis Thresholds[1]	100	100	100	100	100
Exceed *de minimis* Thresholds?	No	No	No	No	No

[1] *De minimis* thresholds for General Conformity of SDAB nonattainment pollutants ROG and NO_X, and maintenance pollutant CO; and for NEPA significance determinations of SDAB nonattainment pollutants, and SDAB attainment pollutants SO_X, PM_{10}, and $PM_{2.5}$.
Source: Modeled by AECOM 2014; for more detail see Appendix K

As shown in Table 3.11-16, the estimated annual emissions associated with Alternative 1A are less than the General Conformity *de minimis* thresholds. Therefore, temporary emissions associated with Alternative 1A would conform to the SIP, and a formal conformity analysis would not be required. **No substantial adverse direct or indirect effects would occur.**
Similar to construction activities, operation and maintenance activities for Alternative 1A would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Because the use of off-road heavy-duty diesel equipment would be temporary, because equipment would operate at varying distances, and because further reductions in exhaust emissions would be made, maintenance-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. Therefore, **operation and maintenance-related TAC impacts to sensitive receptors associated with Alternative 1A would be less than significant (Criterion C).**

As mentioned earlier, signalized and unsignalized intersections in the project area would continue to operate at LOS D or better with implementation of the project alternatives. Therefore, it is not anticipated that operation of Alternative 1A would cause a CO hotspot. Specifically, the CO concentrations resulting from the project would not violate the CAAQS for either the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). Therefore, **this impact would be less than significant (Criterion C).**

Operational emissions associated with maintenance activities would include odors from exhaust from diesel equipment similar to construction activities. Infrequent maintenance worker trips would not be anticipated to generate or expose persons to substantial odor emissions. Therefore,

Alternative 1A would not create objectionable odors affecting a substantial number of people. **Impacts associated with odors would be less than significant (Criterion D).**

No Project/No Federal Action Alternative

The No Project/No Federal Action Alternative would result in continued periodic maintenance at the project site and would therefore result in continued periodic emissions. Currently, management of the lagoon involves mechanical excavation to maintain an open inlet condition, as funding allows. Under this alternative, no dredging or excavation would occur to improve tidal circulation, channel clearing, or other comprehensive actions to improve tidal exchange or upstream flooding. The lagoon inlet would remain in its existing location.

Since there is no increase in activities under the No Project/No Federal Action Alternative, emissions would also not increase. Therefore, **emissions associated with the No Project/No Federal Action Alternative would be less than significant (Criteria A, B, C, and D).**

3.11.4 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Under NEPA, estimated emissions associated with each of the alternatives are less than the General Conformity *de minimis* thresholds. No substantial adverse direct or indirect effects have been identified, so the project design features and additional measures below are considered avoidance and/or minimization measures under NEPA.

Construction-related emissions would exceed the recommended levels of significance for ROG and NO_X for Alternative 2A, Alternative 1B, and Alternative 1A, and construction activities could lead to a violation of an applicable air quality standard under CEQA (Criterion B for temporary and permanent conditions). Implementation of mitigation measures would address potential violations of air quality standards as a result of construction-related activities associated with construction of Alternative 2A, Alternative 1B, and Alternative 1A. To ensure that fugitive dust emissions do not exceed the applicable thresholds of significance for PM_{10} and $PM_{2.5}$, the County of San Diego also recommends typical design considerations that may be incorporated into projects to avoid air quality impacts. Project design features include measures to reduce criteria pollutant emissions, including requirements to maintain equipment and vehicles, minimizing idling time, and using appropriately sized engines to support the required scope of work. To reduce construction-related criteria pollutant emissions, Alternative 2A, Alternative 1B, and Alternative 1A shall implement the following mitigation measures for the duration of the construction period:

AQ-1 Off-road construction diesel engines not registered under ARB's Statewide Portable Equipment Registration Program that have a rating of 50 horsepower (hp) or more, shall meet, at a minimum, the Tier 3 California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 2 engines will be allowed on a case-by-case basis when the Contractor has documented that no Tier 3 equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

AQ-2 Harbor craft with a Category 1 or 2 marine engine, such as tugboats used for material disposal, shall meet, at a minimum, EPA Tier 2 marine engine emission standards.

AQ-3 Dredging equipment shall be electric, if feasible, based on availability and cost.

AQ-4 Contractors shall use alternative fueled (e.g., compressed natural gas [CNG], liquefied natural gas [LNG], propane), or electric-powered construction equipment where feasible, based on availability and cost.

AQ-5 The following measures shall be implemented by the construction contractor to reduce fugitive dust emissions associated with off-road equipment and heavy-duty vehicles:

- Exposed surfaces (e.g., unpaved access roads) shall be watered, as necessary, to control fugitive dust.
- Sweepers and water trucks shall be used to control dust and debris at public street access points.
- Dirt storage piles shall be stabilized by chemical binders, tarps, fencing, or other suppression measures.
- Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads.
- Cover haul trucks or maintain at least 12 inches of freeboard to reduce blow-off during hauling.
- Enforce a 15-mph speed limit on unpaved surfaces.

CEQA Mitigation Measure AQ-1 requires engines in diesel-fueled construction equipment above 50 hp to meet Tier 3 emission standards. Tier 2 and Tier 3 emission standards became effective between 2001 and 2008, with the effective date dependent on engine horsepower. The OFFROAD model used in the analysis contains ranges of tier engines and uses average fleet data

to develop emission factors for a given calendar year. Because the earliest year for project construction would be 2016 and the requirements for production of Tier 2 engines have been in effect for over 10 years, it is reasonable to assume that most, if not all, offroad construction equipment would meet Tier 2 emission standards without the application of CEQA Mitigation Measure AQ-1. Based on the improvements in emissions standards required by ARB, the analysis assumes that using off-road construction equipment with Tier 3 engines would result in an additional 38 percent reduction in both ROG and NO_X emissions from the use of Tier 2 equipment. Mitigation Measure AQ-1 would achieve an even greater reduction in emissions compared to the use of equipment with Tier 1 engine standards.

CEQA Mitigation Measure AQ-2 addresses marine vehicle engines and would require the use of tugboats that meet Tier 2 marine engine standards and would result in a 45 percent reduction in both ROG and NO_X emissions. The use of electric dredging equipment, if feasible, would reduce ROG and NO_X emissions associated with dredging activities.

The estimated reductions in daily criteria pollutant emissions achieved by CEQA Mitigation Measures AQ-1 and AQ-2 were estimated by multiplying unmitigated peak daily emissions by the percentages discussed above. Table 3.11-17 shows the mitigated construction emissions for the project alternatives.

Table 3.11-17
Mitigated Daily Construction Emissions

Emission Source	Criteria Pollutant Emissions (pounds/day)				
	ROG	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Alternative 2A	**81**	**837**	**407**	**77**	**35**
Alternative 1B	**72**	**711**	**355**	**71**	**29**
Alternative 1A	**72**	**702**	**462**	**80**	**37**
Daily Thresholds	75	250	550	100	55
Exceed Thresholds?	Yes	Yes	No	No	No

Source: Modeled by AECOM 2014; for more detail see Appendix K

The mitigated emissions shown in Table 3.11-17 do not include reductions associated with CEQA Mitigation Measures AQ-1 and AQ-2. Emission reductions associated with CEQA Mitigation Measures AQ-3 and AQ-4 would be dependent on implementation and were not quantified for this analysis.

3.11.5 LEVEL OF IMPACT AFTER MITIGATION

Implementation of Mitigation Measures AQ-1 through AQ-5 would ensure construction activities associated with the project would reduce criteria pollutant emissions.

CEQA: As shown in Table 3.11-17, the mitigated ROG emissions for Alternative 2A would continue to exceed the applicable significance thresholds. Mitigation Measures AQ-1 and AQ-2 would reduce ROG emissions associated with Alternative 1B and Alternative 1A to a less than significant level. Even with implementation of Mitigation Measures AQ-1 and AQ-2 discussed above, construction-related NO_X emissions for the project alternatives would continue to exceed the threshold of significance.

As discussed above, the use of electric dredging equipment was not quantified for this analysis. Mitigation Measure AQ-3 could reduce ROG emissions for the project alternatives to a less than significant level. However, even with the use of electric dredging equipment as discussed in Mitigation Measure AQ-3, NO_X emissions for the project alternatives would continue to exceed the threshold of significance because vehicular traffic alone would exceed the threshold. Therefore, construction activities for Alternative 2A, Alternative 1B, and Alternative 1A could lead to a violation of an applicable air quality standard. This impact would remain significant and unavoidable.

As discussed earlier in this section, PM_{10} and $PM_{2.5}$ emissions for the project alternatives would not exceed the applicable thresholds of significance. Implementation of CEQA Mitigation Measure AQ-5 would ensure that PM_{10} and $PM_{2.5}$ emissions would be less than significant.

NEPA: The estimated annual emissions for the project alternatives would not exceed the *de minimis* thresholds. Therefore, no substantial adverse direct or indirect effects would occur.

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